Appl. No.: 10/763,647
Amdt. dated 02/20/2006
Reply to Office action of 11/21/05

REMARKS/ARGUMENTS

In the Office Action dated November 21, 2005, Claims 1-16 and 18-25 are pending. The Examiner rejects Claims 1-16 and 18-25 under 35 U.S.C. § 103(a) as being unpatentable over the admitted state of the prior art in view of U.S. Patent No. 5,893,683 to Johnson, U.S. Patent Application Publication No. 20020168241 to David et al., and U.S. Patent Application Publication No. 20050015980 to Kottilingam et al. In addition, the Examiner rejects Claims 1-16 and 18-25 under 35 U.S.C. § 103(a) as being unpatentable over the admitted state of the prior art in view of Johnson, David, and Japanese Patent No. 01-188657 to Yamada.

Applicants have amended independent Claims 1 and 13 to further patentably distinguish the cited references. Dependent Claim 3 has been amended in light of the amendment to Claim 1. Therefore, in light of the claim amendments and subsequent remarks, Applicants respectfully request reconsideration and allowance of the claims.

A. Independent Claims 1 and 13

Independent Claim 1 has been amended for clarification and to further distinguish each of the cited references, taken alone or in combination, as will be explained in further detail below. Claim 1 has been amended to recite routing a portion of the workpiece including the defect such that routing removes the defect and at least a portion of the workpiece proximate to the defect. The routing step includes controlling a depth to which the workpiece is routed with a micro-stop countersink apparatus, wherein routing further comprises controlling the routing such that at least a portion of the routed portion of the workpiece is defined by a sidewall and a conical bottom surface extending angularly from the sidewall.

Independent Claim 13 of the present application has also been amended to further clarify and distinguish the cited references. In particular, Claim 13 has been amended to recite that the router bit contacts the defect and the area proximate to the defect in a direction generally orthogonal to the workpiece to remove the defect and at least a portion of the workpiece proximate to the defect. Moreover, independent Claim 13 recites that the routed portion is

defined by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall.

B. The Cited References

Applicants refer to the previous Amendment filed October 14, 2005 for a discussion of the Johnson and David references. Newly cited Kottilingam discloses a method of repairing combustion turbine components having damage, such as a crack, located at or near a cooling hole or hollow/complex portion. The method of Kottilingam includes forming a groove along at least a portion of the crack, and spraying a filler material into the groove with a micro-plasma torch. The groove extends longitudinally and co-axially with the crack, as well as vertically and co-axially with the crack, but does not extend through the entire depth of the crack.

Yamada discloses a method for repairing a glass-lined device by removing a portion of the glass-lining layer around a broken part (e.g., pinholes) on a base metal, and thermally spraying a ceramic material onto the formed recess, where the formed recess is preferably a conical configuration.

C. The Rejections of Independent Claims 1 and 13 under 35 U.S.C. § 103(a) are Overcome

It is initially submitted that in light of the aforementioned amendments to independent Claims 1 and 13, Kottilingam teaches away from any combination with the remaining cited references. In particular, Claims 1 and 13 now recite that routing removes the defect and a portion of the workpiece proximate to the defect. In contrast, Kottilingam specifically teaches away from removing the defect, as Kottilingam discloses:

> [0021] Care should be taken to form the groove 18 with dimensions that assist the repair processes of the present invention. Suitable dimensions advantageously include a longitudinal length slightly greater (e.g. about 0.5-4 mm) than the longitudinal length of the crack 16 so that any weak areas toward the longitudinal end(s) of the crack 16 are also repaired. The groove 18 advantageously has a vertical depth of about 40%-90% of the crack 16 depth, preferably about 60%-70%. Thus, the preparatory groove 18 does not remove or carve out the entire crack 16, but rather leaves a portion of the crack 16 vertically extending from the cooling hole 14 toward the groove 18. The vertical depth of the groove 18 is

advantageously generally conical shaped promote better fusion, although other geometries could be used such as U-shaped, oval, circular, and the like. (Emphasis added).

Therefore, unlike the claimed invention, Kottilingam discloses that the entire defect is not removed such that there is no suggestion or motivation to combine Kottilingam with any of the remaining cited references, including Johnson, David, and Yamada. Namely, Johnson does not disclose that the router removes defects at all, while David discloses that layers of defective aircraft skin may be removed rather than routing a portion of the aircraft skin including the defect. Although the Examiner does not combine Kottilingam with Yamada, Yamada discloses that a layer of the necessary minimum size including the broken part is removed.

Furthermore, Applicants submit that independent Claims 1 and 13 are distinguishable from each of the cited references, taken individually or in combination. In particular, none of the cited references, taken individually or in combination, disclose controlling the routing such that a routed portion includes a sidewall and a conical bottom surface extending angularly from the sidewall, as recited by Claim 1, or a routed portion that is defined by a sidewall extending generally orthogonal to the workpiece and a bottom surface extending from the sidewall, as recited by Claim 13. As shown in FIG. 7 and 7a of the present application, the routed portion includes a sidewall **20** and conical bottom surface **22**.

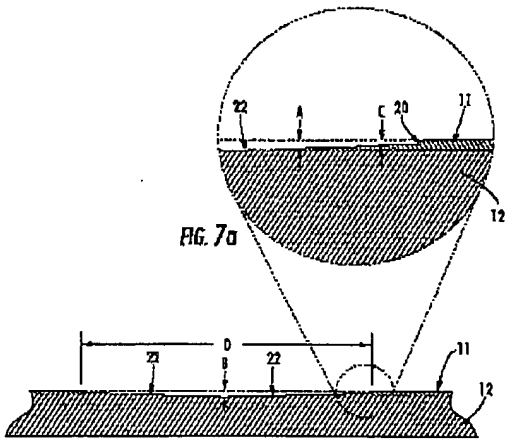

FIG. 7a

FIG. 7

Conversely, and as shown in Figure 5 of Johnson, the routed portion includes a vertical sidewall and a horizontal bottom surface joined by a rounded edge within the workpiece, which is specifically distinguished in the Background of the present application. Figure 5 of Johnson clearly shows a routed portion that includes rounded edges, which is unlike the claimed invention, where sharp edges or corners may be formed between the sidewall and the conical bottom surface.

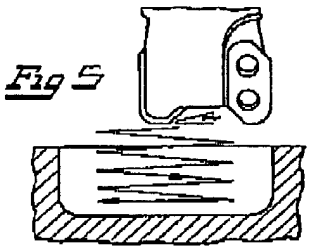

FIG. 5 of Johnson

Johnson discloses that the opposite corners of the cutting edges may be left square like that shown at the lower end of Figure 4a (col. 2, lines 64-65). Even assuming that "left square" corresponds to an angular cutting edge (an assumption with which Applicants do not agree), Johnson does not teach or suggest forming a conical bottom surface within the workpiece. In fact, Johnson discloses that the cutter head includes an axial depression that would prohibit the cutting inserts from forming a conical bottom portion in the workpiece. Johnson discloses that the axial depression "in the form of a truncated cone is turned in the end face to provide clearance for the ramping entry of the router into the workpiece at the angle α indicated in FIG. 1 and again in FIG. 5" (col. 2, lines 44-47). As such, the combination of the truncated cone and flat bottom cutting edge of Johnson teach away from forming a routed portion having a conical bottom surface defined in the workpiece, as recited in independent Claims 1 and 13.

Moreover, the Examiner relies upon Kottilingam as disclosing a conical bottom surface. As discussed above, Applicants submit that Kottilingam cannot be properly combined with the Johnson and David references. In any event, Kottilingam does not teach or suggest a routed portion defined by a sidewall and a conical bottom surface extending angularly from the sidewall, as recited by independent Claim 1, or a routed portion defined by a sidewall that is generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall,

as recited by Claim 13. In this regard, Kottilingam discloses that the preparatory groove may be "generally conical shaped [to] promote better fusion, although other geometries could be used such as U-shaped, oval, circular, and the like" (¶ 21). Figure 2 of Kottilingam apparently illustrates a "U-shaped" groove and does not provide a figure for a conical shaped groove. Regardless, Kottilingam does not teach or suggest that the conical shaped groove would otherwise extend angularly from a sidewall extending within a workpiece or from a sidewall extending generally orthogonal to the workpiece.

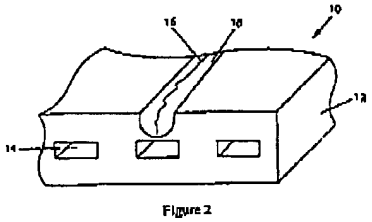

Figure 2

FIG. 2 of Kottilingam

The Examiner also relies on Yamada as disclosing a conical recess that removes the broken part and a portion of the glass-lining layer. However, as shown in FIG. 2 of Yamada, the recess does not define a conical bottom surface, but rather a truncated cone or frustum. As such, Yamada fails to disclose a recess defined by a conical bottom surface let alone a recess defined by a sidewall and a conical bottom surface extending angularly from the sidewall or by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall.

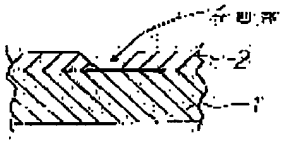

FIG. 2 of Yamada

Furthermore, David does not disclose a specific profile of the routed portion and, thus, also does not teach or suggest a routed portion defined by a sidewall and a conical bottom surface extending angularly from the sidewall or by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall, as recited by independent Claims 1 and 13, respectively.

As none of the references discloses a routed portion defined by a sidewall and a conical bottom surface extending angularly from the sidewall, or a routed portion defined by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall, the combination of the references also fails to teach or suggest independent Claims 1 and 13 of the present application. Therefore, the rejections of independent Claims 1 and 13 under 35 U.S.C. § 103(a) over the cited references are overcome. As such, it is submitted that the pending dependent claims are allowable for at least those reasons discussed above with respect to independent Claims 1 and 13, respectively.

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CONCLUSION

In view of the amendments and remarks presented above, Applicants submit that the present application is in condition for allowance. As such, the issuance of a Notice of Allowance is therefore respectfully requested. In order to expedite the examination of the present application, the Examiner is encouraged to contact Applicants' undersigned attorney in order to resolve any remaining issues.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

Trent Kirk
Registration No. 54,223

Customer No. 00826
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111

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Tammy Stevens — February 20, 2006
Date